

An Examination of Time-Use and Transportation Barriers to On-Campus Participation of Postsecondary Students

Jeff Allen & Steven Farber

presented at the 2018 Transportation Research Board annual conference in Washington, D.C.



Geography & Planning
Transportation Research Cluster

Introduction

Success in postsecondary education is related to the amount of time spent on campus. The more often students attend class and access on-campus learning resources, the better their grades and the lower their dropout rates (Tinto, 1999; Bozick, 2007).

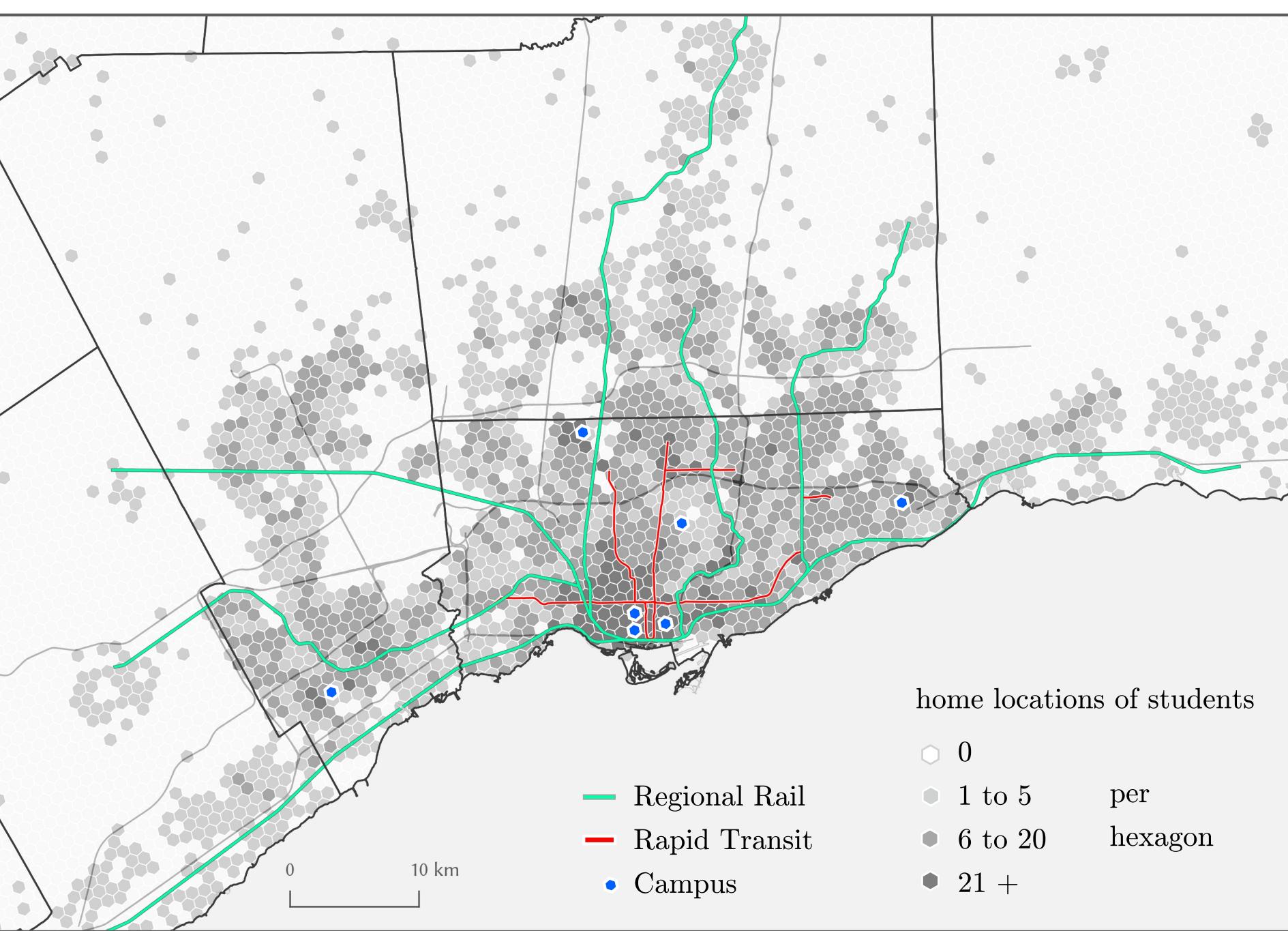
However, students living in large cities can face tremendous transportation and time-use barriers that make it difficult to spend more time on campus (Kamruzzaman et al., 2011)

Objective

Examine the transportation and time-use factors that affect...

- 1) how often students visit their campuses
- 2) whether students feel that their commutes dissuade them from travelling to campus, selecting courses, and participating in extra-curricular activities

Study Area



Data Sources

1) Online Survey

1-day travel survey (StudentMoveTO, 2015) of students across seven university campuses in the Toronto region (n = 15k)

	Gender	Student Status
	Female	67.5%
	Male	32.5%
Average Age		23.3
Typical Commute Mode		
Walk		18.0%
Bike		6.4%
Transit		64.0%
Car as Passenger		3.6%
Car as Driver		7.9%
Transit Pass Owner		43.9%
Commute Frequency		
0-2 days per week		11.3%
3 days per week		15.8%
4 days per week		27.1%
5 days per week		33.0%
6-7 days per week		12.8%
Employment		
Does Not Work		42.4%
0-20 hours per week		42.3%
20 + hours per week		15.3%
Average Household Size		3.6

2) Network Graphs

To extract detailed characteristics of home-campus trips, including data for walking distances, wait times, in-vehicle travel times, and number of transfers

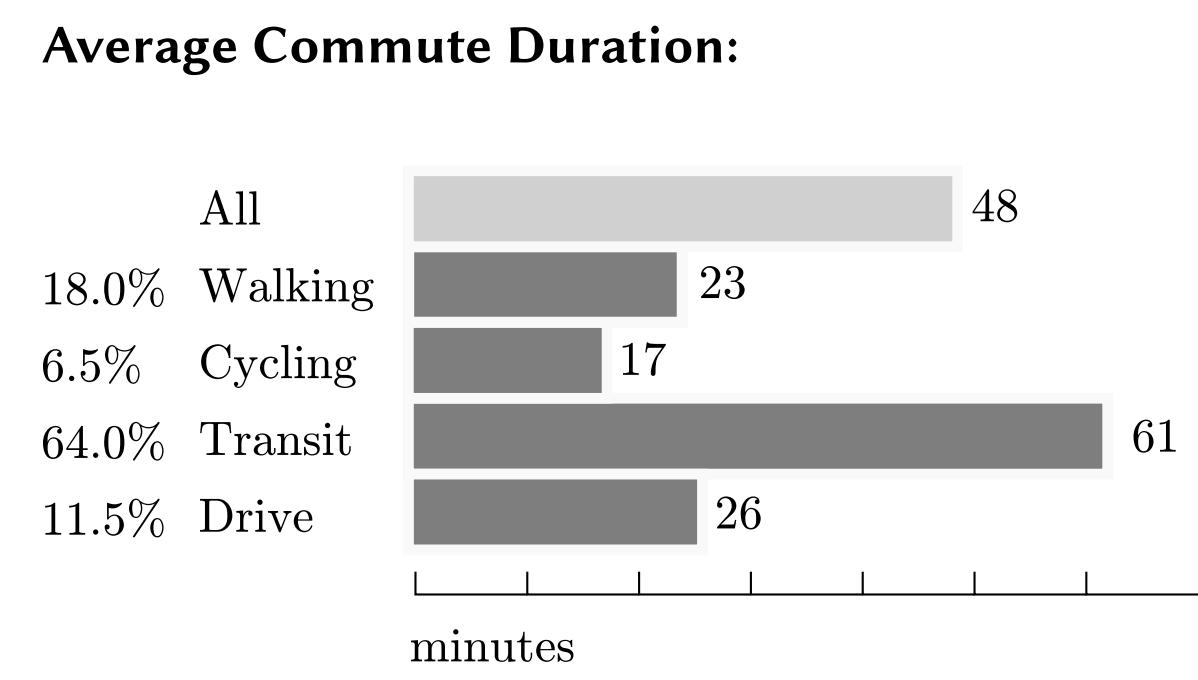
Inputs of OpenStreetMap and GTFS data for 9 transit agencies.

Built with OpenTripPlanner, and scripted with Python.



Analysis

1) Descriptive Analysis of Trip Attributes



Transit commute attributes:
average wait time = 10 minutes
average walk distance = 1.3km
87% transfer at least once
46% transfer two times or more

3) Modelling Commute Frequency

(D) How many days per week do you commute to campus?

Ordered Logistic Model Results:

Home-Campus Duration	-
Employment	
Does Not Work	ref
0-20 hours per week	-
20 + hours per week	-
Gender	
Female	ref
Male	+
Age	-
Student Status	
Undergrad Full-Time	ref
Undergrad Part-Time	-
Graduate Full-Time	-
Graduate Part-Time	-
Campus	
U of T St. George	ref
U of T Mississauga	-
U of T Scarborough	-
York Glendon	-
York Keele	-
OCAD University	-
Ryerson University	-
Typical Commute Mode	
Walk	ref
Bike	+
Transit	-
Car as Passenger	-
Car as Driver	-
Number of trips per day	-

2) Modelling Barriers to Participation

The probability that someone answers YES to the following prompts

- (A) Does your commute sometimes discourage you from coming to campus?
- (B) Do you pick your courses based on your commute?
- (C) Does your commute discourage you from participating in university-organized activities or events?

Binary Logistic Model Results:

	(A)	(B)	(C)
Home-Campus Duration	+	+	+
Employment			
Does Not Work	ref	ref	
0-20 hours per week	+	+	+
20 + hours per week	+	+	+
Gender			
Female	ref	ref	ref
Male	-	-	-
Age	-	-	-
Student Status			
Undergrad Full-Time	ref	ref	ref
Undergrad Part-Time	-	-	-
Graduate Full-Time	-	-	-
Graduate Part-Time	-	-	-
Campus			
U of T St. George	ref	ref	ref
U of T Mississauga	-	+	-
U of T Scarborough	+	+	+
York Glendon	-	+	-
York Keele	+	+	+
OCAD University	-	+	+
Ryerson University	+	+	+
Typical Commute Mode			
Walk	ref	ref	ref
Bike	-	-	-
Transit	+	+	+
Car as Passenger	-	-	-
Car as Driver	-	-	-
Number of transfers	+	+	+

Conclusions

- students with longer commute durations and/or work part-time are less likely to travel to campus and participate in on-campus activities
- barriers are greater for those who take transit or drive, even after controlling for travel time
- significant differences in participation with regards to age and gender
- household factors were not found to be significant in affecting on-campus participation

Acknowledgments

Data: StudentMoveTO (2015), OpenStreetMap, Toronto Transit Commission, GO Transit, Durham Region Transit, York Region Transit (YRT)/Viva, MiWay, Brampton Transit, Oakville Transit, Burlington Transit, Hamilton Street Railway
Tools: Python, R, PostGIS, QGIS, InkScape, Mapbox, LaTeX
Funding: QELI/ESRI Canada Graduate Scholarship in Science and Technology, Ontario Ministry of Research, Innovation and Science Early Researcher Award
People: Matti Siemiatycki and Md Moniruzzaman for their contributions in developing the original plan of research, also Chris Harding and other researchers and funding partners in the StudentMoveTO initiative for conducting the survey